

Analysis Of Lost And Stolen Data For Trend Identification, Calendars Year 2001 - 2002

Summary

Based upon the analysis, we did not identify any trend or information indicating that reported losses and thefts of licensed material over the last two years represent a substantive safety risk. In addition, there was no identifiable pattern to support the idea that individuals are stealing portable moisture density gauges for malevolent use.

Discussion

An analysis of data from the NRC's Nuclear Materials Event Database (NMED) for the calendar years 2001 and 2002 was conducted to identify a pre-9/11 baseline and post-9/11 trends for lost and stolen moisture density gauges and radiographic cameras. Each moisture density gauge contains approximately 8 millicuries (0.3 GBq) of Cesium-137 and 40 millicuries (1.48 GBq) of Americium-241/Beryllium in the form of sealed sources. With the exception of radiographic cameras which contain high activity sources, the remaining percentage of stolen sources (~20%) have an activity in the microcurie to low millicurie range and are typically contained in gauging/measuring devices, and ionization devices used for static elimination. Due to the low activity range, the stolen sources are not likely to be candidates for malevolent use.

Graph (next page): Stolen versus lost moisture density gauges, CY 2001-2002

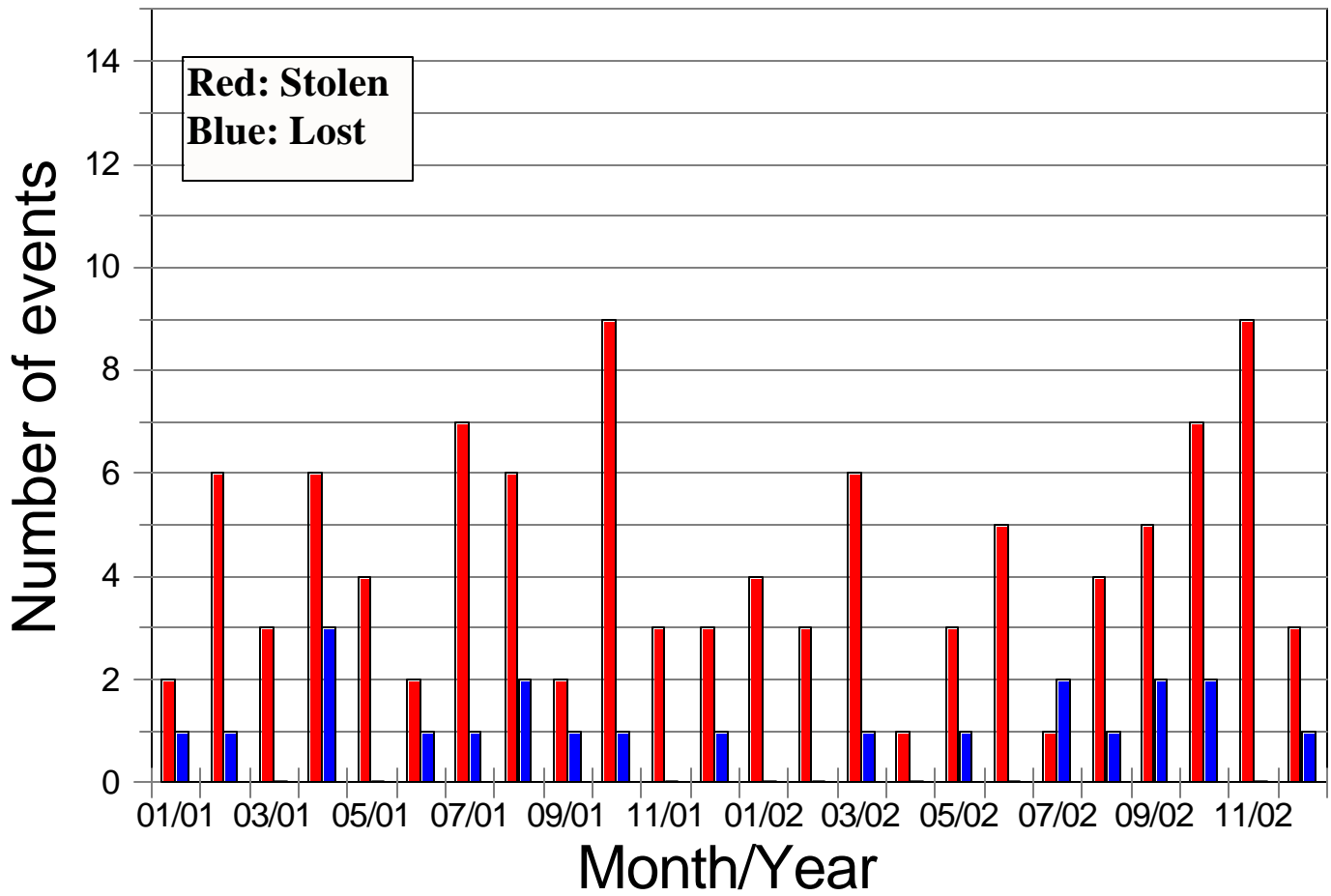
One hundred and four events involving stolen moisture density gauges occurred during CY 01-02 as compared to 22 events involving loss of a moisture density gauge for the same time period.

An average of 4.5 gauges were stolen per month during 2001. The same average of 4.5 stolen gauges per month continued during 2002.

An average of 1 gauge was lost per month during 2001. The same average of 1 lost gauge per month continued during 2002.

Conclusion: The trend for lost and stolen moisture density gauges remained constant between CY 2001 and 2002. There is no evidence of potential accumulation of large number of these types of sources.

Stolen vs Lost Moisture Density Gauges CY 2001 - 2002



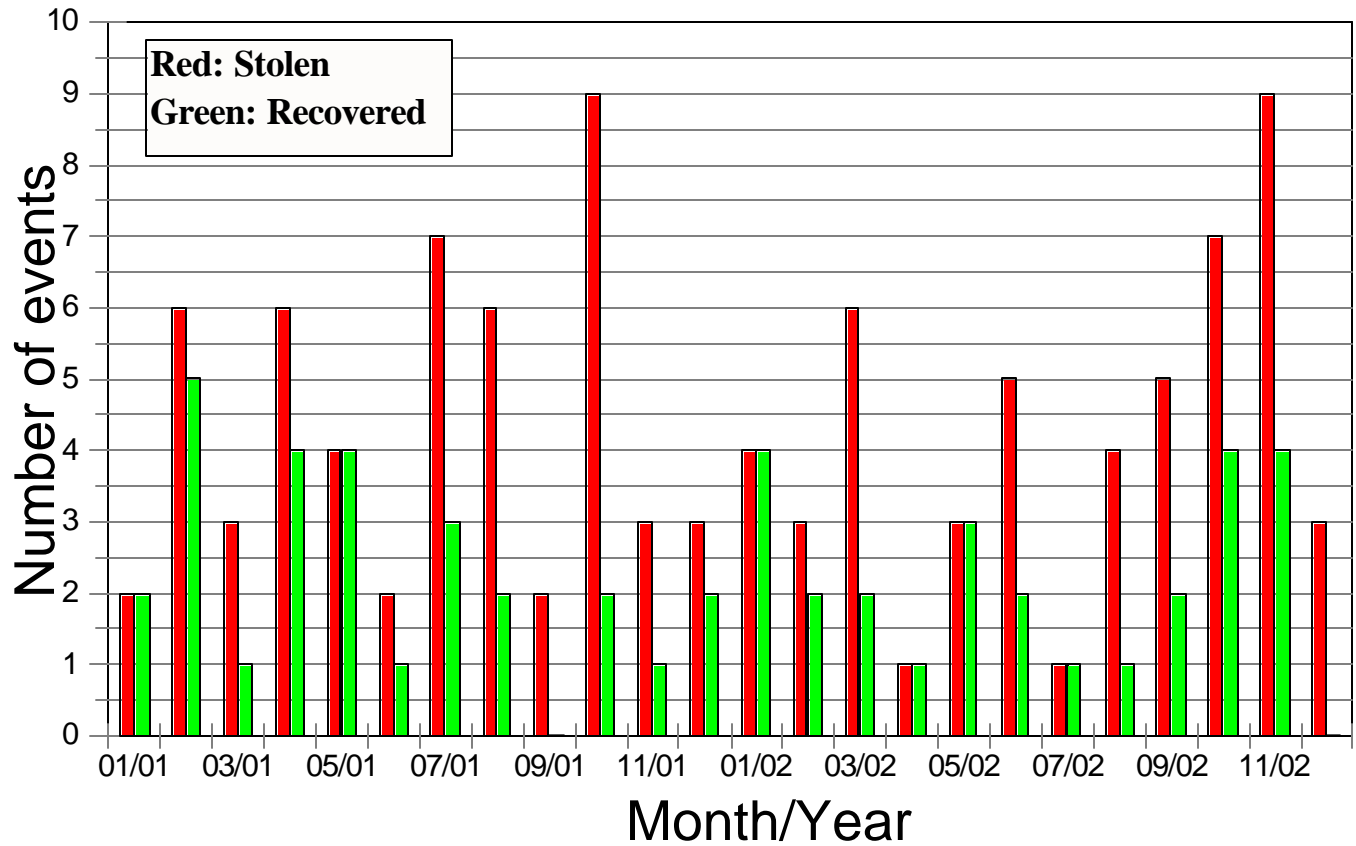
Graph (next page): Stolen versus recovered moisture density gauges, CY 2001-2002

Fifty-three events involving stolen moisture density gauges occurred in 2001. Of these 53 events, 27 resulted in the recovery of the gauges (51% recovery rate).

Fifty-one events involving stolen moisture density gauges occurred in 2002. Of these 51 events, 26 resulted in the recovery of the gauges (51% recovery rate).

Conclusion: At this moment, there is not an identifiable pattern (increasing number of events post 9/11) to support the idea that individuals are stealing moisture density gauges for malevolent use.

Stolen vs Recovered Moisture Density Gauges, CY 2001 - 2002



Graph (next page): Moisture density gauges stolen along with vehicle versus recovery, CY 01-02

Ten events involving moisture density gauges stolen along with a vehicle occurred in 2001. Of these 10 events, 9 resulted in the recovery of the gauge (90% recovery rate).

Five events involving moisture density gauges stolen along with a vehicle occurred in 2002. Of these 5 events, 5 resulted in the recovery of the gauge (100% recovery rate).

Conclusion: There is clear indication that individuals stealing a vehicle containing a moisture density gauge are likely to quickly dispose of the gauge (by leaving it by the side of a road or in a garbage container), since stealing the gauge is not their primary motive (no malevolent intention).

Moisture Density Gauges Stolen Along With Vehicle vs. Recovery, CY 01 - 02

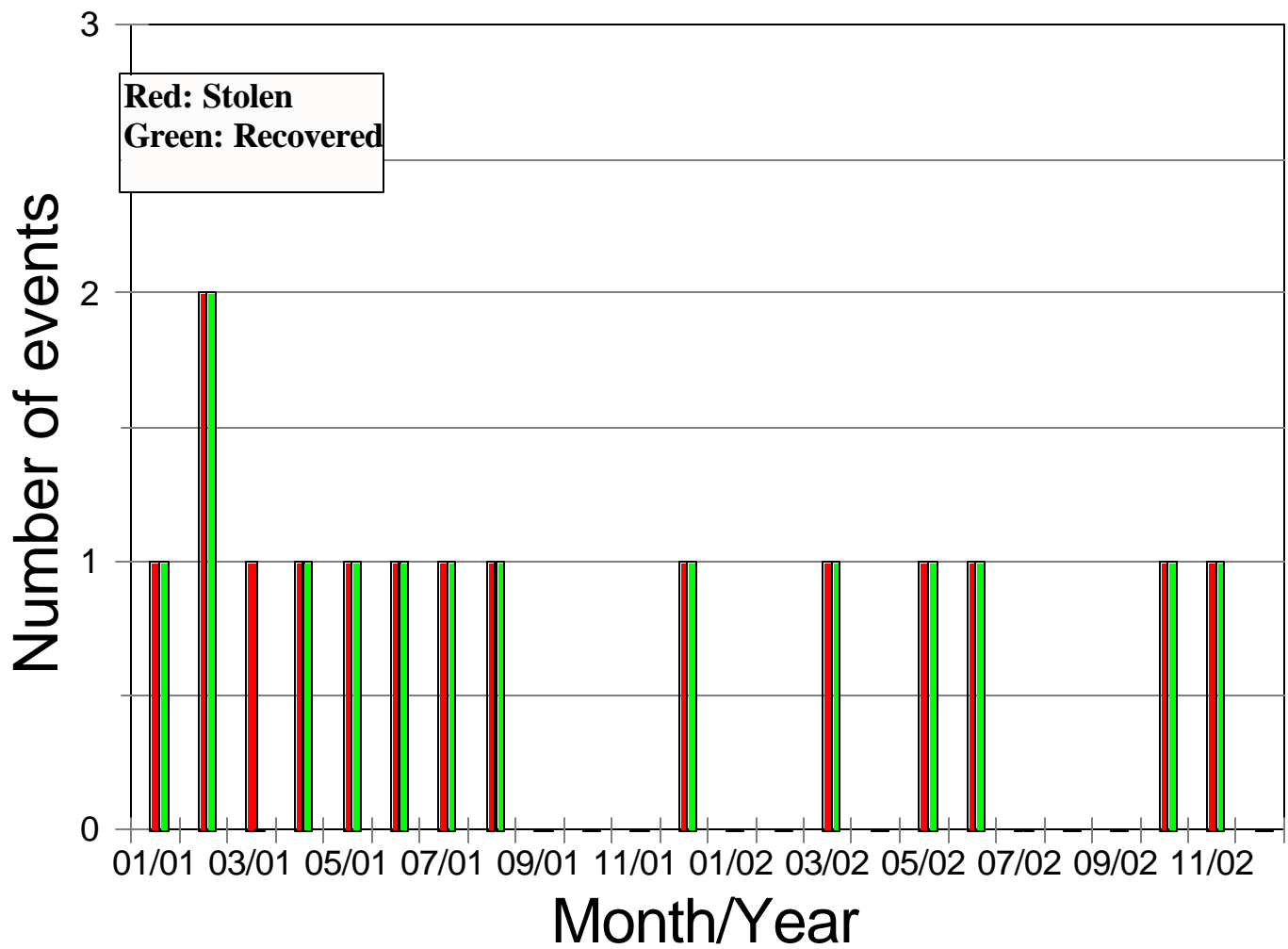


Table 1. Statistics on Stolen Gauges Reported to the NMED, CY 01-02

State	Number of stolen gauges** [A]	Number of recovered gauges** [B]	Recovery rate (%) [B/A]	Number of licensees*	Number of gauges* [C]	Gauges stolen rate (%) [A/C]
Oklahoma	4	3	75	63	130	3.1
Arizona	6	3	50	101	300	2.0
Washington	5	0	0	100	250	2.0
Louisiana	3	1	33	30-40	150-200	1.7
Tennessee	4	3	75	94	267	1.5
Puerto Rico	2	2	100	28	147	1.4
Michigan	5	2	40	125	400	1.3
New Jersey	2	1	50	61	100-200	1.3
California	15	6	40	569	1400	1.1
West Virginia	2	1	50	47	205	1.0
Idaho	1	1	100	48	100	1.0
Texas	15	7	47	348	2000	0.8
North Carolina	2	1	50	100	250	0.8
Indiana	1	0	0	40	120	0.8
Georgia	3	1	33	94	410	0.7
Mississippi	1	1	100	75	150	0.7
Alabama	2	1	50	120	300	0.6
Pennsylvania	2	1	50	143	300-400	0.6
South Carolina	1	0	0	70	200	0.5
Utah	1	0	0	80	200	0.5
Wisconsin	1	1	100	100	200	0.5
Florida	8	5	63	300	1800	0.4
Colorado	4	3	75	130	500-1500	0.4
Oregon	1	1	100	132	285	0.4
Illinois	2	0	0	250	1000	0.2

Nevada	1	0	0	140	500	0.2
Ohio	2	1	50	105	1082	0.2
Kentucky	1	1	100	200	600	0.2
State	Number of stolen gauges** [A]	Number of recovered gauges** [B]	Recovery rate (%) [B/A]	Number of licensees*	Number of gauges* [C]	Gauges stolen rate (%) [A/C]
Maryland	1	1	100	100	500	0.2
New Mexico	1	0	0	n/a	n/a	----
Arkansas	0	----	----	80	250	----
Maine	0	---	----	40	75	----
New York	1	1	100	250	n/a	----
North Dakota	0	----	----	20	50	----

* Most of these numbers are estimates based on a survey made to the Agreement States in October 2002, and from information collected from the NRC regions.

** The numbers of stolen and recovered gauges are obtained based on information reported to NMED.

Conclusions: Most States with high numbers of stolen moisture density gauges, including high numbers of unrecovered gauges, have a large population of gauges (opportunity for theft) and have recovery rates near the average (~53%) of all the data presented in the above Table. This indicates the absence of targeting for malevolent use.

Graph (next page): Lost versus recovered moisture density gauges, CY 2001-2002

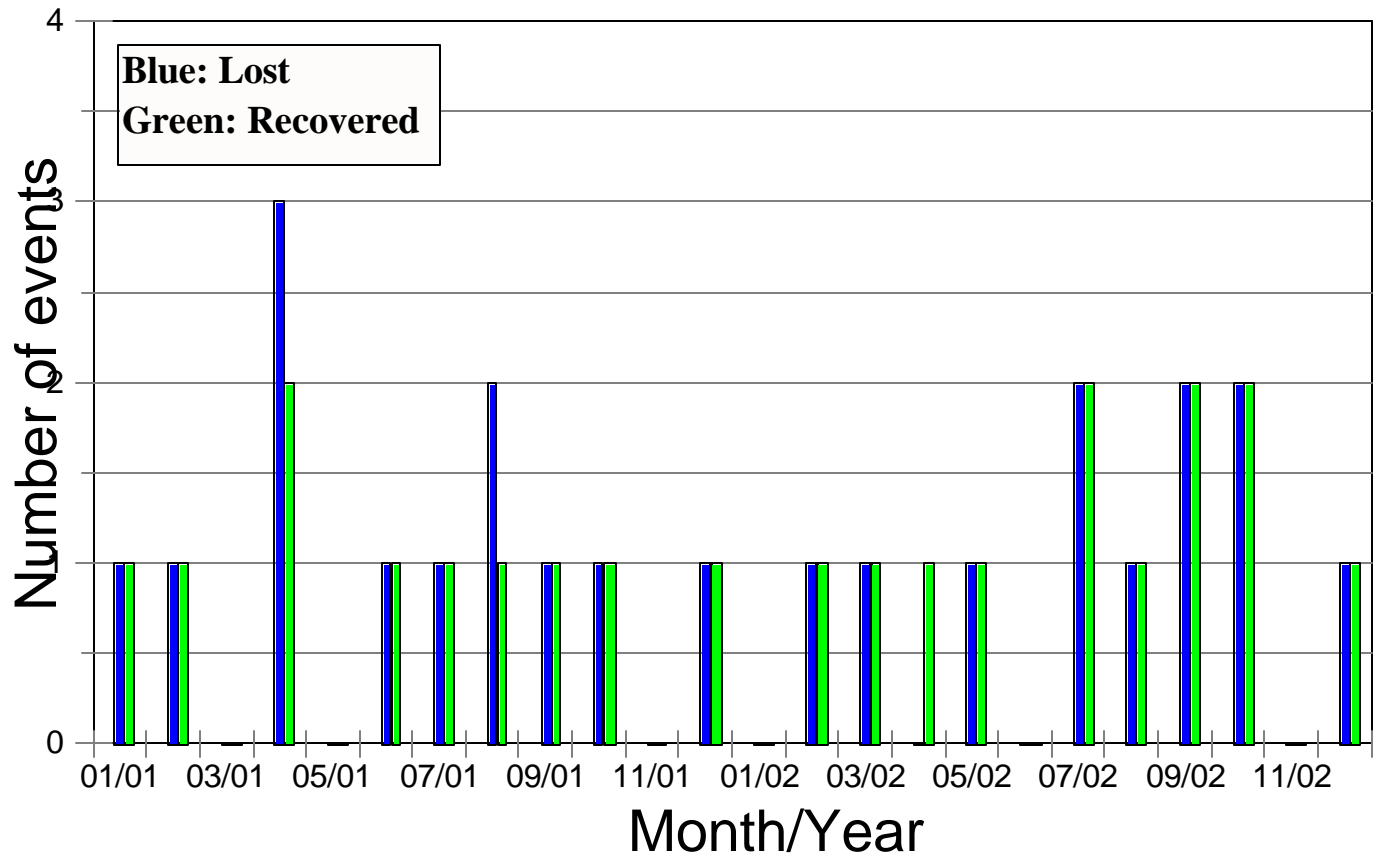
These types of events typically result when the licensee fails to block and brace and the gauge falls from the vehicle when the tailgate opens.

Twelve events involving loss of a moisture density gauge occurred in 2001. Of these 12 events, 10 resulted in the recovery of the gauges (83% recovery rate).

Ten events involving loss of a moisture density gauge occurred in 2002. Moisture density gauges were recovered in all ten events (100% recovery rate). Also an additional event resulted in the recovery of a missing gauge manufactured prior to 1975, for a total of 11 events in which gauges were recovered in the year 2002.

Conclusion: Given the current recovery trend, lost moisture density gauges do not represent a credible source for malevolent use material.

Lost vs Recovered Moisture Density Gauges, CY 2001 - 2002



Graph (next page): Lost and stolen radiographic cameras versus recovery, CY 2001-2002

Two events involving stolen radiographic cameras occurred in 2001. Of these 2 events, 1 resulted in the recovery of the camera.

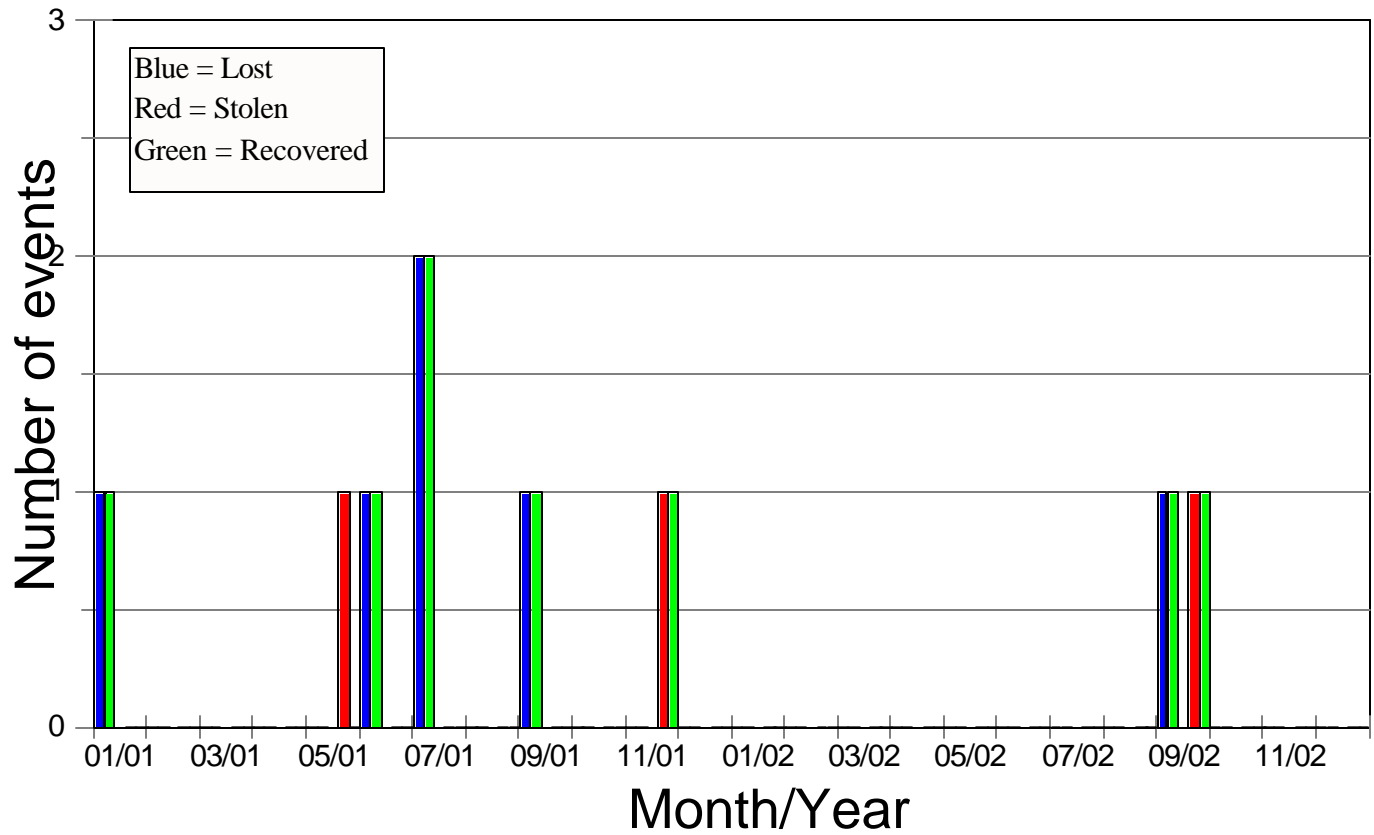
One event involving a stolen radiographic cameras occurred in 2002. The radiographic camera from this event was recovered.

Five events involving lost radiographic cameras occurred in 2001. Of these 5 events, 5 resulted in the recovery of the cameras (100% recovery rate).

One event involving a lost radiographic camera occurred in 2002. The radiographic camera from this event was recovered (100% recovery rate).

Conclusion: There is no indication that radiographic cameras are being stolen for malevolent use.

Lost and stolen radiographic cameras versus recovery, CY 2001 - 2002



Distribution per State of stolen vs recovered stolen moisture density gauge CY 2001-2002				
State, City	Stolen	Recovered	Remarks	
Alabama, Scottsboro	1	0	Other items stolen	
Alabama, Auburn	1	1		
Arkansas, Little Rock	1	1		
Arizona, Tempe	2	2	Vehicle also stolen	
Arizona, Tempe	1	1		
Arizona, Yuma	1	0		
Arizona, Chandler	1	0		
Arizona, Chandler	1	0	Vehicle also stolen	
California, Fresno	1	1		
California, San Diego	2	0		
California, Hemet	1	1		
California, Chino Hills	1	0		
California, Redlands	1	0		
California, Long Beach	2	1		
California, Los Angeles	1	0		
California, Diamond Bar	1	0		
California, Modesto	1	0		
California, Escondido	1	1		
California, Stockton	1	0		
California, Gardena	1	1		
California, Orange	1	1		
Colorado, Denver	2	1		
Colorado, Brighton	1	1		
Colorado, Thornton	1	1		
Florida, Key Biscayne	1	0		
Florida, Kissimmee	1	1		
Florida, Valrico	1	1		
Florida, Miami	3	1	Other items stolen in one of the events	
Florida, Miami	1	1	Vehicle also stolen	
Florida, Fort Lauderdale	1	1	Vehicle also stolen	
Georgia, Atlanta	1	0		
Georgia, Loganville	1	0	Other items stolen	
Georgia, Duluth	1	1	Vehicle also stolen	
Idaho, Lava Hot Springs	1	1		
Illinois, Chicago	2	0		
Indiana, Griffith	1	0		
Kentucky, Park Hills	1	1		
Louisiana, Shreveport	1	1		
Louisiana, Fort Polk	1	0	Other items stolen	
Louisiana, Metairie	1	0		
Maryland, Columbia	1	1		
Michigan, Temperance	1	1	Other items stolen	
Michigan, Ferndale	1	0		
Michigan, Farmington Hills	2	0		
Michigan, Grand Rapids	1	1		

State, City	Stolen	Recovered	Remarks		
Mississippi, Jackson	1	1			
Missouri, Independence	1	1			
Missouri, Joplin	1	1			
Missouri, House Springs	1	1	Vehicle also stolen		
Nevada, Las Vegas	1	0			
New Jersey, Jersey City	1	1			
New Jersey, Phillipsburg	1	0			
New Mexico, Ponderosa	1	0			
New York, Queens	1	1	Vehicle also stolen		
North Carolina, Winston-Salem	2	1			
Ohio, Columbus	1	1			
Ohio, Toledo	1	0			
Oregon, Portland	1	1	Vehicle also stolen		
Oklahoma, Oklahoma City	1	0			
Oklahoma, Del City	1	1			
Oklahoma, Fairfax	1	1			
Oklahoma, Tulsa	1	1			
Pennsylvania, Philadelphia	2	1			
Puerto Rico, San Juan	1	1	Vehicle also stolen		
Puerto Rico, Trujillo Alto	1	1			
South Carolina, North Aux. Field	1	0			
Texas, Cross Roads	1	0			
Texas, Rockwall	1	0			
Texas, San Antonio	1	1			
Texas, Austin	1	1			
Texas, Houston	2	0	Other items stolen in both of the events		
Texas, Houston	3	3	Vehicle also stolen		
Texas, Dallas	3	1	Other items stolen in two of the events		
Texas, Garland	1	0			
Texas, Harlingen	1	1			
Texas, Katy	1	0			
Tennessee, Chattanooga	1	1			
Tennessee, Memphis	1	0			
Tennessee, Old Hickory	1	1			
Tennessee, Corryton	1	1	Vehicle also stolen		
Utah, West Valley City	1	0			
Washington, Centralia	1	0			
Washington, Seattle	1	0			
Washington, Redmond	1	0			
Washington, Issaquah	1	0			
Washington, Spokane	1	0			
West Virginia, Bridgeport	1	0			
West Virginia, Whitesville	1	1	Vehicle also stolen		
Wisconsin, Baraboo	1	1			